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EXAMINER

NELSON, VIVIAN HSU

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/828,579

Applicant(s)

SMITH ET AL.

Examiner

Vivian Nelson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 36-47 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-31 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 11-13, 19 and 32-35 is/are rejected.
- 7) ☒ Claim(s) 6, 10, 14-18 and 20-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Responsive to communication filed on 8 September 2005.

The restriction requirement is restated as follows:

- Group I: Claims 1-35, drawn to an apparatus, classified in class 355, subclass 69.
- Group II: Claims 36-47, drawn to a process, classified in class 355, subclass 77.

Applicant elects the claims of Group I (i.e. claims 1-35) without traverse; therefore, the claims of Group II (i.e. claims 36-47) are withdrawn from consideration.

As stated in the previous office action regarding the restriction requirement, the apparatus of Group I is classified under “photocopying: projection printing and copying cameras”, “electricity to lamp controlled” (subclass 69). Subclass 77 is drawn to methods, which is defined as “including process steps for use in projecting an image of the subject matter on an original sheet or film strip onto a photosensitive paper to make a copy of the original”. In the matter of the claims of Group II, a process is described for using the apparatus of claims 1-35. Therefore, the arguments as set forth by the applicant have not been found persuasive and the restriction requirement is made FINAL.

A treatment of the claims of Group I is given below.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figures 7 and 8 are mislabeled. Specifically, the labels are reversed and correction is required. Corrected drawing sheets in compliance with 37

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CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
 - a. On page 17 line 12 “aperture stop” should be assigned the reference letters AS, not AG.
 - b. The equation numbers are not sequential. For example, Eqns. 300 and 301 on page 18 follow Eqn. 6 on page 16; Eqns. 10 and 11 then follow these on page 19.

Appropriate correction is required.

Claim Objections

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3. Claim 18 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Specifically, claim 18 is a verbatim recitation of claim 14 and both claims are dependent on claim 1. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7-8, 13, 19, 32-35 are rejected under 35 U.S.C. 102(b) as being anticipated by McArthur et al. (US #6,741,338).

4. Regarding claims 1 and 2, McArthur teaches a system for measuring radiant intensity, comprising: a plurality of discrete imaging objectives, each capable of imaging to a corresponding plurality of imaged field points; a common imaging surface for the plurality of discrete imaging objectives to image a plurality of corresponding field points; where the discrete imaging objectives have sufficient resolution to reconstruct a radiant intensity profile of the illumination source (col. 2 line 54 – col. 3 line 8 and col. 1 lines 44-46). In McArthur, the array of apertures are discrete from one another and the ability to maintain the uniformity of small features reads on “sufficient resolution”. It can be also seen from the preceding citation that the intensity profile is reconstructed from a measurement of radiant intensity at the field points. The

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images can be recorded and therefore it is implied that the apparatus produces or exhibits a reconstruction of the radiant intensity profile. (See also col. 4 lines 54-56.)

5. For claims 7 and 8, McArthur anticipates imaging at the micron level to control image contrast and using multiple elements in col. 5 lines 64-66 and Figs. 1-3.

6. Claims 11 and 12 are taught by McArthur as seen in Fig. 1. The common imaging surface is in a plane (i.e. "surface containing all the straight lines that connect any two points on it") beyond (i.e. "on the far side of; past") and before (i.e. "in front of", going from right to left) the mask face.

7. With regards to claim 13, McArthur states that the discrete imaging objectives fit within a reticle-pellicle envelope in col. 6 lines 35-38.

8. With regards to claim 19, McArthur teaches an illuminator using a light source that generates a radiant intensity profile and produces an illuminator beamtrain (col. 4 lines 60-64); a multiple field imaging objective in optical communication with the light source (Figs. 1-3); a projection imaging optic distal the multiple field imaging objective (Figs. 1-3); an electronic sensor array, where the multiple field imaging objective images the radiant intensity profile onto a plane optically conjugate to the electronic sensor array via the projection imaging optic with sufficient resolution to produce a reconstruction of the radiant intensity profile (col. 2 line 54 – col. 3 line 8 and col. 5 lines 33-41). From Figs. 1-3, it can be shown by McArthur that the multiple field imaging objective "optically communicates" with the light source via the light beams radiated by the light source and that the projection imaging optic is "anatomically located far from a point of reference", in this case, the multiple field imaging objective.

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9. For claims 32 and 33, McArthur anticipates a multiple field imaging objective (“projecting a plurality of images”, col. 2 line 65); an aperture blade located at a distance that coincides with a reticle conjugate imaging plane associated with the multiple field imaging objective (Figs. 1-3 and col. 5 lines 33-41); a source relay in optical communication with the multiple field imaging objective (Figs. 1-3); a reticle (col. 5 line 35); where the source relay optic images the multiple field objective image formed at the reticle conjugate imaging plane onto the reticle with sufficient resolution so that the system produces a reconstruction of radiant intensity profile of an illuminator (col. 3 lines 1-8 and see also bullet no. 4 above). In this case, the “optical communication” between the source relay optic and the reticle is the light beams from the effective source, given that McArthur’s system can be adapted for use with reflective masks (col. 13 lines 7-10). Further, McArthur teaches that the multiple field imaging objective comprises multiple elements – see Figs. 1-3.

10. Regarding claims 34 and 35, McArthur discusses a multiple field imaging objective located so that the imaging surface of the multiple field imaging objective coincides with a conjugate imaging plane of a reticle (col. 5 lines 33-41); an aperture blade located at the reticle conjugate imaging plan (anticipated in col. 12 lines 8-14); a source relay optic in optical communication with the reticle so as to relay images of the multiple field imaging objective formed at the reticle conjugate imaging plane onto a substrate with sufficient resolution to produce a reconstruction of radiant intensity profile of an illuminator (col. 2 line 54 – col. 3 line 8). As stated above in bullet no. 8, multiple element field imaging objectives is taught by McArthur in Figs. 1-3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over McArthur as applied to claim 1 above, and further in view of Dickson et al. (US # 2002/0071472).

11. McArthur teaches a projection optical system with a number of unspecified imaging objective lenses (col. 4 lines 60-64). Dickson sets forth laser beam optical system using, among other things, a reflective computer-generated hologram for implementing diffractive optical elements within the system (abstract and in [0137]). In [0305], Dickson uses a plano convex lens – i.e. a positive converging lens – as one of the imaging objectives for a variable frequency hologram. Dickson anticipates an aspherically corrected lens in [0448] in which the aspherical component provides spherical aberration correction in the incident laser beam. It would have been obvious to one of ordinary skill in the art to use a plano convex lens and an aspherically corrected lens in an optical system to manipulate and correct a beam of light passing through the system.

Allowable Subject Matter

12. Claims 6, 10, 14-17 and 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of

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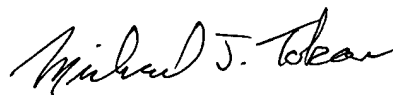
the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

- a) For claims 6, 10 and 14, the prior art fails to show a computer generated hologram incorporated with the reticle top surface, where the reticle face is part of the imaging surface.
- b) With respect to claims 15-17, the prior art fails to show a common mounting for the imaging objectives, which includes a projection imaging tool and a support plate.
- c) Regarding claims 20-22, the prior art fails to show a separating reticle table and an imaging optic that relays the plane to the sensor array.

13. Claims 23-31 are allowed. In this case, the prior art fails to show the illuminator beamtrain being reflected back towards the reflective reticle from the reflective substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vivian Nelson whose telephone number is 571.272.8552. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571.272.2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Michael Tokar
Supervisory Patent Examiner
Technology Center 2800